

Product Summary

BV_{SS}	R_{SS(ON)} Typ	I_S Max T_A = +25°C
24V	7.4mΩ @ V _{GS} = 3.8V	13.0A

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{SS(ON)}) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Battery Management
- Load Switch
- Battery Protection

Features

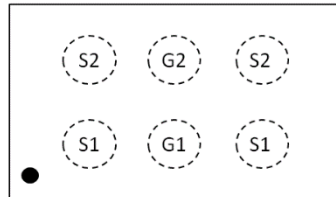
- CSP with Footprint 2.70mm × 1.81mm
- Height = 0.21mm for Low Profile
- ESD Protection of Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

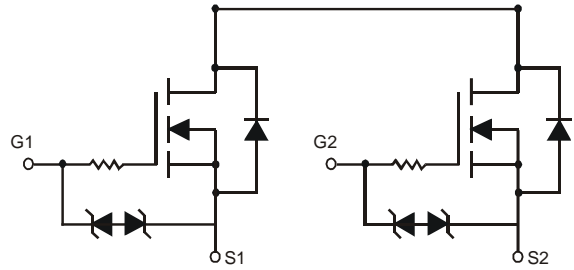
- Case: X3-DSN2718-6
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu or NiAu. Solderable per MIL-STD-202, Method 208 ^{Ⓔ4}
- Weight: 0.0026 grams (Approximate)



X3-DSN2718-6



Top View



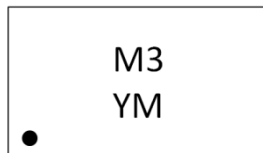
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2012UCA6-7	X3-DSN2718-6	3000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



M3 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: G = 2019)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026			
Code	F	G	H	I	J	K	L	M	N			
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Source-Source Voltage			V _{SSS}	24	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Source Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C	I _S	13.0	A
		T _A = +70°C		10.4	
Continuous Source Current (Note 5) V _{GS} = 2.5V	Steady State	T _A = +25°C	I _S	10.8	A
		T _A = +70°C		8.6	
Pulsed Source Current (Note 6)			I _{SM}	60	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.82	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	151.9	°C/W
Power Dissipation (Note 5)	P _D	2.3	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	55.0	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Source-Source Breakdown Voltage	BV _{SSS}	24	—	—	V	V _{GS} = 0V, I _S = 1mA
Zero Gate Voltage Source Current T _J = +25°C	I _{SSS}	—	—	1	μA	V _{SS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±12V, V _{SS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	0.9	1.3	V	V _{SS} = 10V, I _S = 1mA
Static Source-Source On-Resistance	R _{SS(ON)}	—	7.0	9.0	mΩ	V _{GS} = 4.5V, I _S = 5A
		—	7.3	9.5		V _{GS} = 4.0V, I _S = 5A
		—	7.4	10.1		V _{GS} = 3.8V, I _S = 5A
		—	7.9	10.3		V _{GS} = 3.1V, I _S = 5A
		—	9.1	13.0		V _{GS} = 2.5V, I _S = 5A
Diode Forward Voltage	V _{SS}	—	0.7	—	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	2417	—	pF	V _{SS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	270	—		
Reverse Transfer Capacitance	C _{RSS}	—	102	—		
Total Gate Charge	Q _G	—	26.0	—	nC	V _{SS} = 19.2V, V _{GS} = 4.0V, I _S = 3A
Gate-Source Charge	Q _{GS}	—	5.2	—		
Gate-Drain Charge	Q _{GD}	—	9.5	—		
Gate Charge at V _{TH}	Q _{G(TH)}	—	4.5	—		
Turn-On Delay Time	t _{D(ON)}	—	543	—	ns	V _{SS} = 20V, V _{GS} = 4.0V, I _S = 10A, R _G = 6.0Ω
Turn-On Rise Time	t _R	—	1183	—		
Turn-Off Delay Time	t _{D(OFF)}	—	1810	—		
Turn-Off Fall Time	t _F	—	1602	—		

- Notes:
- Device mounted on FR-4 material with 1inch² (6.45cm²), 2oz. (0.071mm thick) Cu.
 - Repetitive rating, pulse width limited by junction temperature.
 - Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

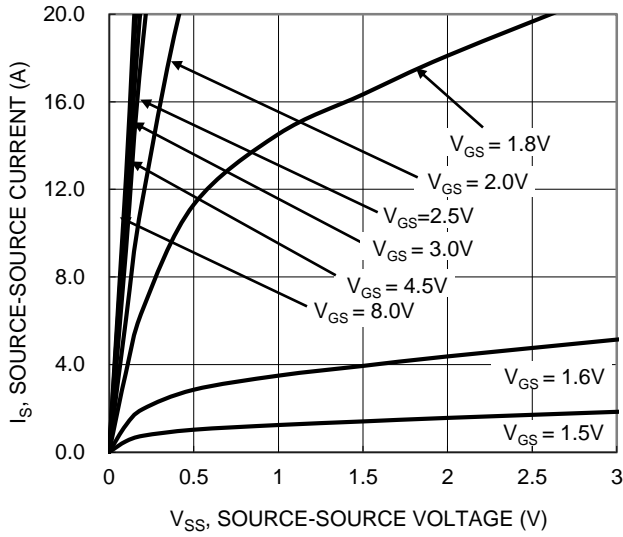


Figure 1. Typical Output Characteristic

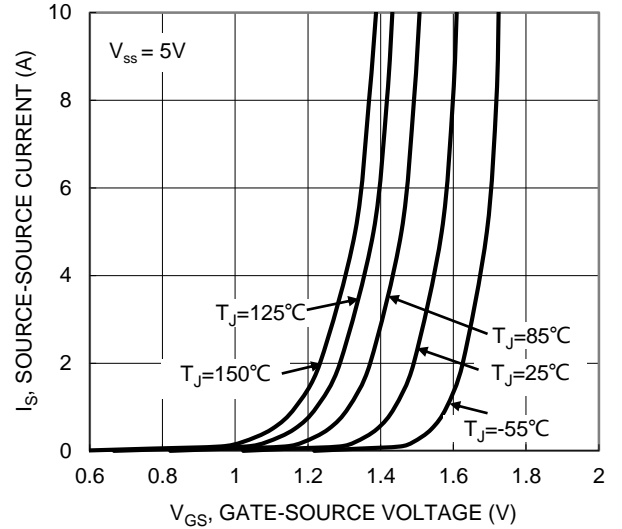


Figure 2. Typical Transfer Characteristic

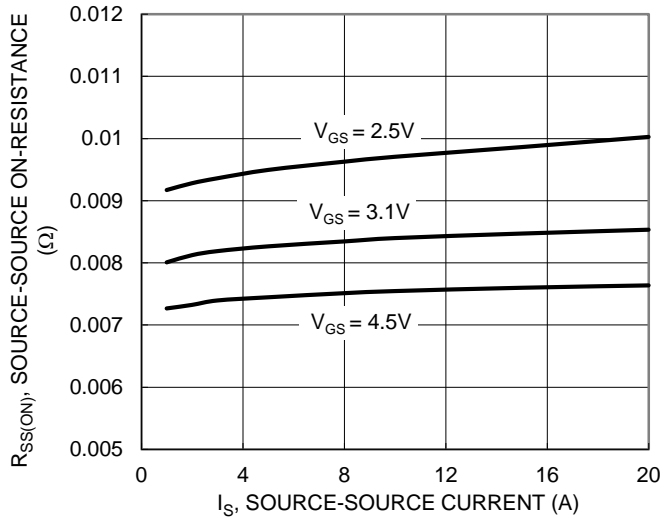


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

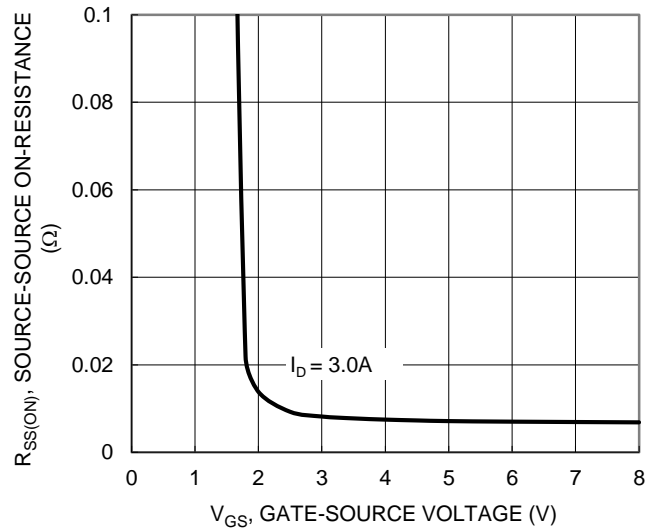


Figure 4. Typical Transfer Characteristic

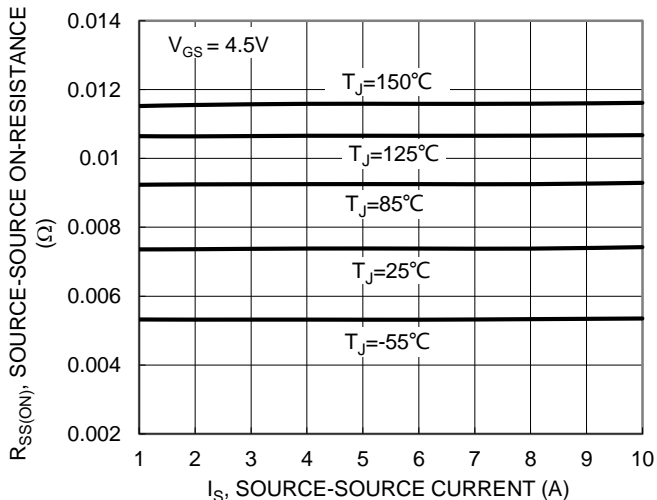


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

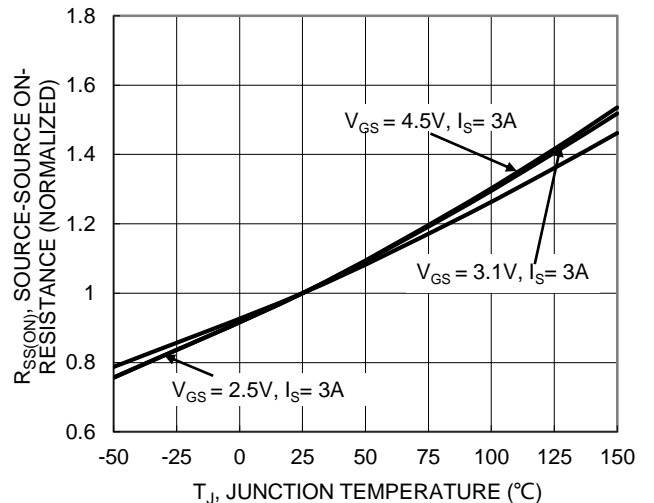
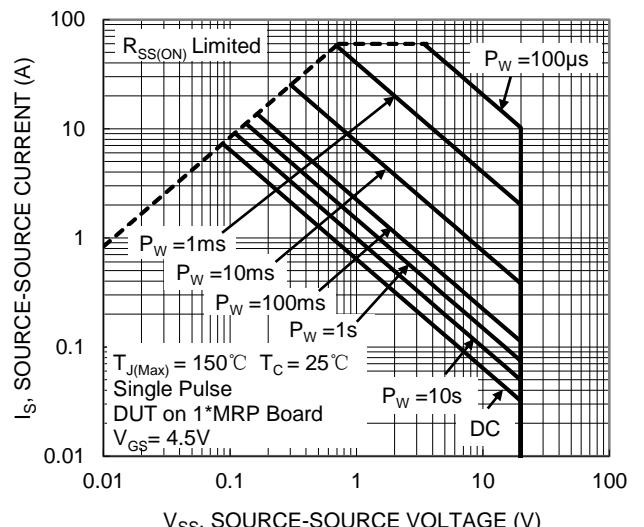
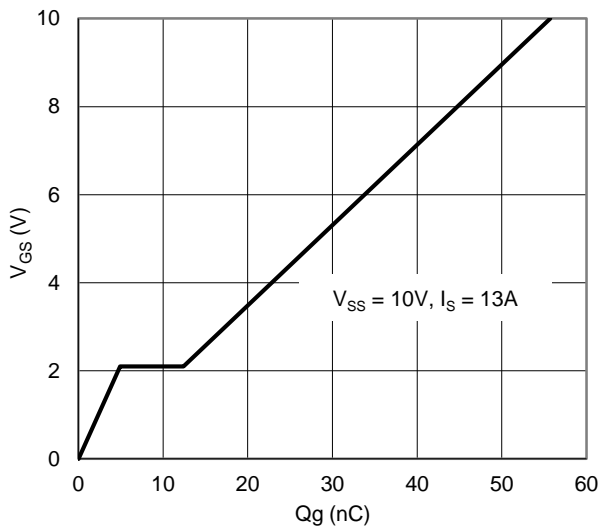
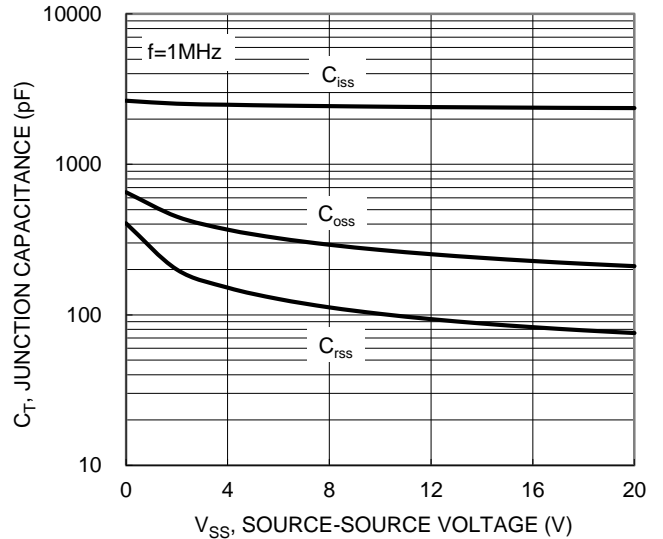
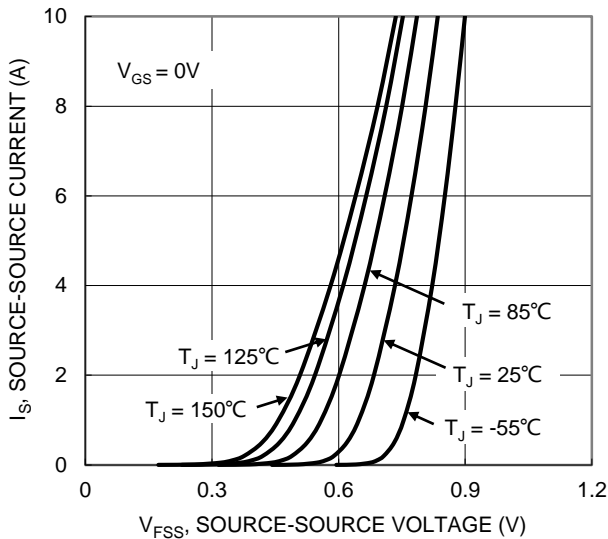
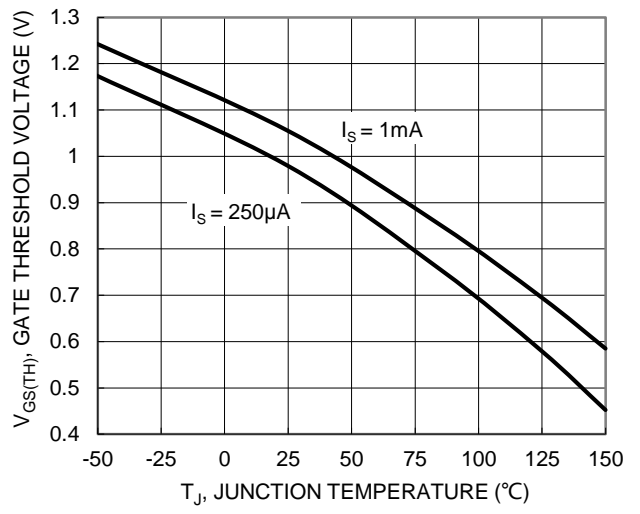
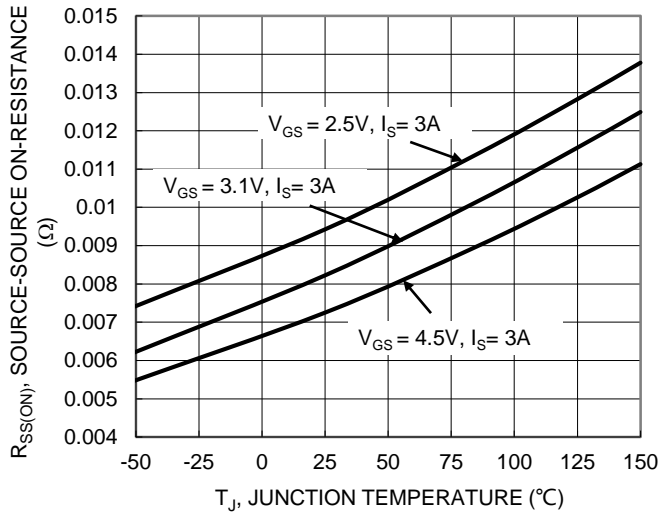


Figure 6. On-Resistance Variation with Junction Temperature



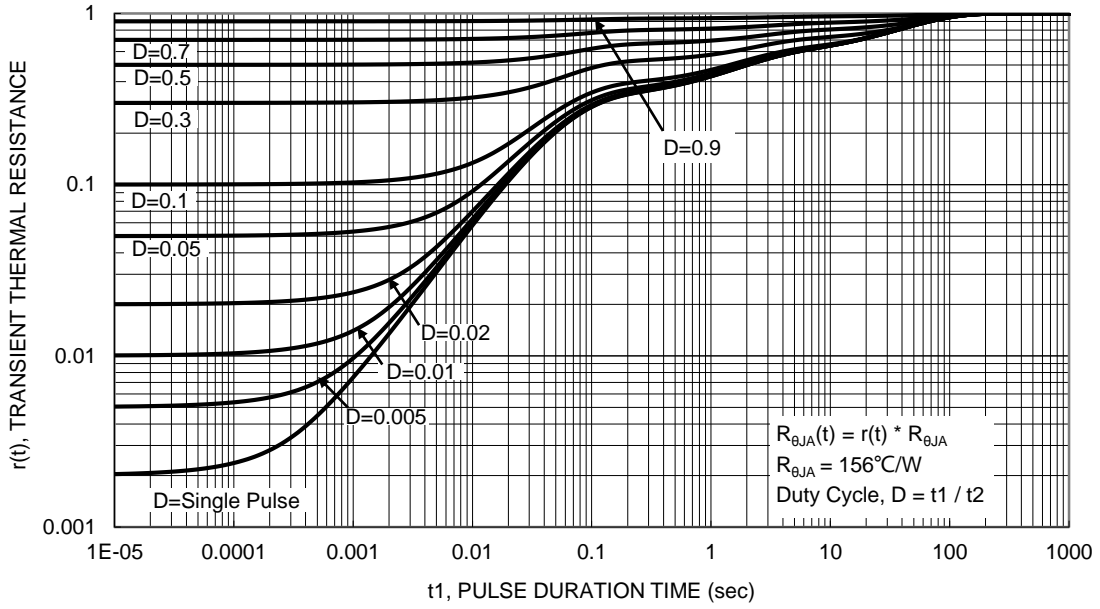
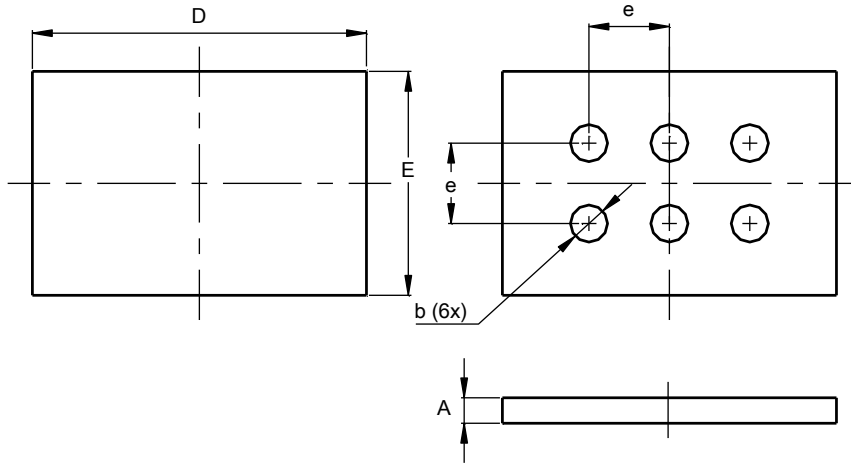


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

X3-DSN2718-6

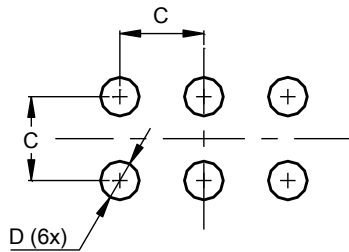


X3-DSN2718-6			
Dim	Min	Max	Typ
A	0.16	0.26	0.21
b	0.27	0.33	0.30
D	2.65	2.75	2.70
E	1.76	1.86	1.81
e	0.62	0.68	0.65
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

X3-DSN2718-6



Dimensions	Value (in mm)
C	0.65
D	0.30

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